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ABSTRACT

This report describes a use study designed to facilitate the selection of books that will be needed and used by identifying heavily used subjects and publishers in an academic library's collection of nursing books. Discussions include the study background and significance, study limitations, and basic assumptions. In addition, the procedures for data collection are described, including an inventory of the entire collection of 522 nursing books to ascertain their availability for use; the identification of classifications with average circulations higher than the average for the entire collection; and the analysis of publishers to determine those whose books circulated heavily. Based on the findings of this examination, it was considered prudent to purchase all the nursing output of those publishers who most frequently publish nursing books and to purchase duplicates in those classification areas which receive heavy circulation. It was also decided to test the significance of the study findings by monitoring the use of the books purchased as a result of the study and to conduct a user survey to determine user perceptions of collection adequacy. In addition, the use of Spearman rank order correlation to compare sample analysis with complete set analysis indicated that sampling would not be an acceptable technique for examining collections of this size. Statistical results are presented in three tables, and eight references are provided. (KM)

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An Examination and Analysis of Circulation Patterns in the Nursing Books of an Academic Library

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ABSTRACT

After identifying areas of an academic library collection experiencing overuse, a need to execute a closer examination of use patterns in those areas was felt. The first purpose of the study was immediately to identify individual titles circulating so heavily they frequently will be unavailable when needed. Those titles were duplicated. The data collected on the titles (class number, publisher, publication date, date of last circulation, and whether available on the shelf) were organized in a file in a database management system. Various analyses were conducted in an attempt to generalize about the books being used. Subject areas and publishers were identified that account for the most use. Books in the identified subject areas published by the identified publishers will be purchased in duplicate in the future. A follow up study of these books will be done to ascertain if duplicate purchase was justified.

Introduction

One of the most troublesome aspects of collection development in an academic library is predicting use of a book before it is purchased. As budgets decrease, wise use of funds available becomes more critical. Librarians are loathe to spend precious dollars for books that will only gather dust on the shelf while students and faculty search in vain for the titles they need. Frequently, what is needed is not to be found in the library catalog. Even more frustrating, though, is finding the book listed in the catalog, but missing from the shelf.

Librarians seeking to solve these problems have methods available for identifying heavily used titles and duplicating them so that enough copies are available to satisfy the needs of users. Far more difficult, if not impossible, is predicting use before purchase. Librarians would like to be able to avoid purchasing titles that will not be used, and know what titles initially to purchase in duplicate, before heavy circulation triggers purchase of extra copies.

The Problem

In the academic library being studied, the books in the Library of Congress Class RT (nursing books) have been identified as the most heavily circulating and overused group of books in the collection. Extra money has been allocated to build the collection, but more information was needed so that the money would be spent wisely. An analysis

of the circulation of each book in the class identified the books to be duplicated. The analysis also answered the question: Can current use of a collection be used to predict future use and provide information to aid in the purchase of new titles?

Research Hypothesis

Specific subjects and publishers can be identified that will aid the collection development librarian in the selection of books that will be needed and used.

Background and Significance of the Study

Methods for collection development range from the intuitive to the quantitative. The intuitive method sometimes is used because data is not available for more scientific processes. The librarian may not know how to collect such data, may not have the resources to collect it, or may not be interested in collecting it.

Lack of interest in quantitative methods may be positive rather than negative. In other words, some librarians advocate the intuitive method of collection development. They maintain that acquisitions policies based on use are philistine and that the resulting collections lack academic and intellectual integrity. Librarians espousing this philosophy often seem to imagine that if use generates purchase, selection is abandoned. McGrath points out that this need not be the case. He advocates allocating funds based on use, and then using

standard selection guidelines for purchase of individual titles.

Any librarian desiring to use a quantitative method for allocating book purchase funds has plentiful material from which to choose. The pioneering work in the field was done, not by librarians, but by industrial engineers working in the area of operations research. The first was Morse, who addressed the problem of library effectiveness. In his work, he discusses acquisition allocations among subject fields, and a method of determining the number of duplicate copies to purchase.

Also regarded as a pioneer in the field is Trueswell. His classic study uses the due date of last circulation to identify a core collection of books that will satisfy the needs of most library users. He also is concerned with the problems of weeding, storage, length of circulation periods, and security for particular items. His work was continued by Turner, who concerned himself with sampling size and procedures while still addressing weeding, storage, and duplication. Turner concedes that some library decision making must be based on intuition and experience, but advocates greater reliance on quantitative knowledge about library use.

Following this important work in identifying heavily used items for retention and duplication is the work of McGrath, a librarian who devised a formula based on circulation within classification sections for the allocation of funds. Another librarian, Lancaster, proposed

a method for identifying stressed areas of a collection and relieving that stress. Simmons was another advocate of using the output of a system to modify the input, and was an early user of the computer for analyzing circulation. Cubberley combined the work of Lancaster and McGrath to devise a formula based on circulation and stress that allocates extra funds to stressed areas. As a result of these studies, librarians have models to follow in identifying the areas of the collection needing development and making funds available for them. Methods also exist for identifying particular titles needing duplication or multiple copies.

What is lacking is a way to identify, before purchase, titles that will receive heavy use and that should be initially purchased in duplicate or multiple copies. Identifying a heavily used title after it is in the collection means that some users already have been frustrated by its unavailability when they needed it. Such post-purchase identification not only is frustrating to users who need the extra copy before it is available, but is expensive to the library as well. The process of identifying, reordering, and reprocessing a title is wasteful of time, staff, and resources. It would be much more economical to purchase two or more copies, process them simultaneously, and have sufficient copies on the shelf for use when needed. A study is needed, then, to determine if present circulation analyzed by detailed classification number and publisher can predict future circulation of

individual titles.

Definition of Terms

This study focuses on academic libraries. These libraries are associated with institutions of higher learning and their collections are intended to support the curriculum. More specifically, they are intended to provide the materials faculty need to prepare for teaching and the materials students need to prepare their work for class. Many academic libraries also support a research function of the university with which they are associated. This study does not address the problem of allocating funds for research materials.

Libraries typically are organized according to some classification scheme. The two most common in this country are the Dewey Decimal Classification and the Library of Congress Classification. These schemes organize collections according to subject matter. Therefore, in the Library of Congress Classification system, books on the subject of nursing have as their broad classification designation the letters "RT". The letters are followed by numbers that further distinguish between subjects within the field of nursing. For instance, the classification "RT85" designates books concerned with psychology in nursing.

A section of the collection is defined as being overused or stressed when the section's percent of the total circulation exceeds its percent of the total collection size. For instance, the nursing collection in the library

being studied represents 3% of the circulation, but only .5% of the collection. It has been defined as stressed, and extra funds have been allocated to purchase books in that particular classification.

A book is said to circulate when it is formally charged out at the circulation desk to be removed from the library building for use. Some books, of course, are used in the library, or illegally removed. McGrath has done studies that indicate in-library use correlates circulation. The study described in this paper includes an inventory to identify books illegally missing from the shelves.

Collection Development is the library specialty of selecting books for a library collection. It includes identification of the subject areas to be collected, the levels, both numerical and intellectual, at which they will be collected, geographic and time periods, languages to be collected, and whether collections will be historical or current.

The intuitive method of collection development designates the librarian as the arbiter of taste. Rather than trying to determine what is wanted or needed, the librarian decides what should be wanted or needed, and supplies that. Few libraries rely wholly on this method, but it is a definite philosophical leaning for many librarians.

The scientific, or quantitative, method of collection development relies on the collection of empirical data to determine what is needed and wanted. Probably no libraries

rely entirely on this method, either, although it likely is more prevalent in public libraries than in academic ones. Even so, librarians exercise judgment and selection in purchasing books. Some are purchased that are considered to be important to literature or in the history of ideas even if there does not appear to be any demand for them. Others may be excluded as morally or aesthetically reprehensible.

What is most to be desired is a scientific method for allocation of funds, careful selection of titles for the expenditure of the funds, and provision for the purchase of important books in all areas of knowledge. It would be useless to hope that every book purchased by the library will be heavily and immediately used. It is to be hoped, however, that a high percentage of titles purchased will be used at some time, and that the remainder are worthy books that should be available if ever they are called for.

Library weeding refers to the removal of books from the collection when they no longer are being used. Duplicate copies may be removed in some cases, leaving just one copy of the book in the collection. An alternative to weeding is the removal to remote storage of little used titles. These then may be retrieved within a day or two if needed. Weeding or storage is necessary to maintain collections of used materials in existing buildings. If collections are allowed to grow year after year without weeding, larger and larger buildings become necessary. If a large portion of the collection is not being used, such building programs are not justifiable.

The library catalog is the list of books and other materials owned by the library. Traditionally, library catalogs were kept on cards, one card to a title. These cards were filed alphabetically by author, with additional cards made to be filed by title, subject, or other appropriate entries. In recent years, library catalogs sometimes are available online, with various points of access provided.

One method of filing catalog cards is by call number. The resulting file is called the shelf list, because it is arranged in the same order that the books are placed on the shelf. When card catalogs are replaced by online catalogs, the shelf list may be retained as the only paper copy available if the system goes down, and as a means of inventorying the collection.

Other methods used to deal with heavily used items, besides duplication, which is the purchase of extra copies of the book, are reduced circulation periods and reserve. If the normal circulation period allowed in a library is three weeks, an item heavily in demand might be assigned a circulation period of one week. Even more restrictive is the reserve system. Books placed on reserve normally are due back in one or two hours, and may not be taken from the library building.

Limitations of the Study

Within the limits of the study, data collection was complete and accurate. However, the study is of the RT

collection in one library only. The collection is known to be inadequate, so if the inadequacies included missing subject areas or publishers, these were not identified. Because the collection is small, sampling was not done. Instead, every book in the collection was analyzed. However, at the conclusion of the study, a sample was taken to ascertain if a sample would have shown the same results as examining every title.

Basic Assumptions

It was assumed that the library under study desired to supply its users with the books they need when they need them, and that there is no policy against duplication of titles. It is also assumed that a book illegally missing from the shelf was a needed book that should be replaced if available for purchase, and replaced in duplicate if it met the criteria established for duplication by the study. Circulation of nursing books was assumed to be the result of use for course assignments by registered students.

Procedures for Collecting Data

The data collected for each book was

1. Availability for use
2. Exact class number
3. Publisher
4. Publication date
5. Last due date
6. Total number of circulations

7. Current status (charged or not charged)

Availability for use was ascertained by an inventory. Each card in the shelf list, excluding reference titles and periodicals, was checked against the shelf. If the book was on the shelf, no action was taken, but if the book was missing, a paper clip was attached to the right side of the card.

After the inventory was complete, current circulation was checked. The library has a combined online catalog and circulation system. Thus each book in the collection is represented by a complete bibliographic record with circulation record attached in the catalog. The circulation record gives the last due date and total number of times the book has circulated.

Again using the shelf list, each record was called up. On a separate card for each title, the complete subject portion of the call number, the publisher, the publication date, and last due date were recorded. A sample is provided in Figure 1.

Figure 1

Form for Data Collection

If the card had a paper clip indicating that the book was not on the shelf, but the online record indicated that the book was on the shelf, the word "missing" was written on the card and the paper clip left where it was. If the card was clipped and the online record indicated that the book was charged out, the paper clip was moved to the left hand side of the card, and a code written on the card meaning that the book was circulating. If the book was on the shelf and not charged out, a code for that was written on the card.

After this data was collected, one more check of the shelves was done for cards with right hand paper clips. This was to find books that may have been in use in the library at the time of the inventory, or that may have been returned but not yet shelved.

Procedures for Treating Data

The data collected was organized in files in a relational data base management system called Ingres. Ingres files were created to manipulate and aid in interpretation of the data.

The average circulation of the entire collection of 522 books was 4.485, with the highest circulation of any book 27 circulations. Titles with a circulation greater than eight, and missing titles, were identified and considered for duplication. New editions were ordered if available. In some instances, two copies of new editions of heavily used titles were ordered.

Classifications with average circulations higher than the average for the entire collection were identified, and the number of books in each of these classes counted. The results are displayed in Table 1.

Table 1

Classes with High Circulation

Class	Average circ	No. books
RT86.75	10.000	1
RT84.5	9.308	13
RT89	8.125	48
RT85	7.800	5
RT90	7.333	9
RT81.5	7.263	19
RT24	6.000	2
RT86.5	5.824	17
RT55	5.200	10
RT51	5.000	2
RT82	4.923	13
RT41	4.521	48

The subjects represented by these classes are nursing research, patient education, psychology of nursing, emergency care, and nursing management and administration.

Publishers whose books circulated heavily were next analyzed. Those publishers producing many nursing titles are listed in Table 2, with their average circulations. As indicated, most, but not all, of these publishers were among those with high average circulations. The most active producer of nursing books in this collection, Mosby, with 89 titles in the collection, had an average circulation of 6.101. This is well over the average circulation for the total collection. On the other hand, ten publishers

represented by one title only were on the list of publishers with above-average circulation. Of these, four were not in areas of greatest circulation.

Table 2

Average Circulations of Books Identified by Publisher

PUBLISHER	TITLES	AVG.CIRC
Aldine	1	5.000
American Nursing Association	20	1.000
Appleton/Century/Crofts	35	5.686
Aspen	25	3.520
Blackwell	1	8.000
Churchill Livingston	12	5.000
Columbia University Press	1	5.000
Contemporary Publishers	8	5.000
Davis	13	4.846
Delmar	2	5.500
Duxbury	3	7.000
Human Resources Press	1	10.000
Intermed Communications	9	5.556
Lexington	1	11.000
Lippincott	35	4.857
Little, Brown	21	5.524
Macmillan	14	4.357
Masson	1	7.000
McGraw-Hill	36	4.472
Mosby	89	6.101
National League for Nursing	11	2.727
Nursing Digest	2	6.500
Nursing Resources	14	3.571
Prentice-Hall	20	3.400
Prodist	1	7.000
Putnam	1	7.000
R & L	1	6.000
Springer Verlag	20	4.200
Temple University Press	1	5.000
Van Nostrand Reinhold	4	7.000
Wiley	22	5.818

It would appear that there is no way to predict the circulation of books by infrequent publishers. All the frequent publishers, though, had respectable circulations, even if they were not above the average for the total

collection. Thus it would be prudent to purchase all the nursing output of these publishers, with duplicates purchased in classification areas of heavy circulation.

A closer look at Mosby revealed that its books were concentrated slightly more in the areas of heavy circulation than were the total books. Of the 522 books inventoried, 189, or 34%, were in the heavily circulating classes. Of the Mosby books, 38 of the 89 owned, or 42%, were in the heavily circulating classes. This indicates that Mosby tends to publish in used areas.

Conclusions and Significance

As a result of the study, duplicates and new editions were ordered where needed, and new titles in the subject areas identified as most heavily used were ordered. The approval plan vendor was requested to adjust the library's approval profile to provide two copies of books published by Mosby, Appleton/Century/Crofts, Churchill Livingston, Davis, Lippincott, Little-Brown, and Wiley in the most used subject areas. One copy of every book published by those publishers in other subject areas of nursing, or in those subject areas by other publishers is to be supplied.

Before any of the new books are added to the collection, a user survey will be conducted in nursing classes. The survey will attempt to ascertain user perception of collection adequacy. After the collection development plan has been in operation for one semester, nursing students will again be surveyed to ascertain if

perceptions of collection adequacy improve.

Not all the data collected was used. An analysis of last circulation date correlated with publication date could reveal if newer materials are in demand, or if older materials also are used. It could also help determine if one could generalize an age for weeding nursing books. If such a generalization could not be made, at least individual books that have failed to circulate in the last five years could be identified for weeding.

Finally, a sample was taken to determine if the model would be suitable for a collection of comparable size using sampling techniques. The average circulation was higher (5.103) for the sample than for the complete set (4.485). However, the difference is only about one half of a circulation.

The sample found only 35 classes, while the complete set consists of 51 classes. All the missed classes held, obviously, fewer than six books, as the sample consisted of every sixth book. Table 3 shows the class numbers identified as high in circulation by the sample compared with their average circulation and rank in the full set.

Table 3

Comparison of Results,

Complete Set and Sample

SAMPLE			FULL SET	
CLASS NO.	AVG. CIRC	RANK	CLASS NO.	AVG. CIRC.
RT89	12.429	1	RT86.75	10.000
RT85	10.000	2	RT84.5	9.308
RT81.5	9.333	3	RT89	8.125
RT90	8.500	4	RT85	7.800
RT84.5	8.000	5	RT90	7.333
RT86.5	8.000	6	RT81.5	7.263
RT97	7.000	7	RT24	6.000
RT55	6.000	8	RT86.5	5.824
RT85.5	6.000	9	RT11	5.000
RT4	5.667	10	RT51	5.000

Spearman rank order correlation applied to this comparison, even with the small classes not discovered by the sample removed, yields a coefficient of .416. This is not a significant correlation. It must be concluded that sampling is not an acceptable technique for collections of this size. If other classification sets in the health sciences, that also are both stressed and small, are to be analyzed, they must be examined title by title rather than sampled.

In order to draw final conclusions from the study, the books bought as a result of the findings must be monitored for circulation after they have been available for a school year. If the books indeed are used, if the user survey indicates improved perceptions of collection adequacy, and if the collection no longer indicates stress, then the findings may be considered significant. The technique could

be applied to other collections with assurance.

In the meantime, important information has been gained about the uses being made of the nursing books, and the publishers of those books. The librarian responsible for selecting books in that discipline can do so with more confidence and expertise. She also can converse more knowledgeably with faculty and publisher sales representatives. Such knowledge on the part of librarians could conceivably influence publishers in their editorial decisions. In short, it places the librarian in control of the purchasing decision, rather than leaving her at the mercy of decisions made by and information supplied by publishers.

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